



**VIBRATION TECHNOLOGY RESONATOR EMPLOYING DOUBLE-ACTING HYDRAULIC PISTON/CYLINDER SINE WAVE GENERATOR**

## STUCK DUAL STRING COMPLETION AT SURFACE INSIDE THE WELLHEAD

**Dottie, Louisiana**

### SITUATION:

When the operator pulled one of the tubing strings from their dual string completion up into the wellhead, the long string got wedged inside of the downhole dual-tubing-wraparound hanger that was about 20' below the wellhead. Furthermore, the dual-string wraparound tubing hanger got stuck in one of the spools of the wellhead. The operator attempted to free it with surface jars without success. The jarring created significant laterals that bowed the tubing above the wellhead without getting any energy to the stuck point.



### SOLUTION:

Apply surface generated acoustic energy from the surface using double-acting hydraulic piston/cylinder vibrator known as the **Resonator**.

### ADVANTAGES OF RESONATOR TECHNOLOGY OVER CONVENTIONAL JARS:

- Jar energy dissipates quickly due to the broadband frequency nature of the impacts. Resonance delivers focused energy at a predetermined frequency that is focused on the point of sticking
- From a standpoint of energy delivered, as measured in ft-lbs, resonance can deliver multiple orders of magnitude in energy over jars
  - It is the change in the energy state at the stuck point, and not the impact force delivered, that liberates stuck tubulars
- Apart from surface jars, downhole jarring techniques require a full round trip of pipe to set the jar assembly in place which may add additional operational risk (and time) to the lost time incident

### RESULTS:

Operator called out Vibration Technology and the resonator was rigged up on the top of the 30 ft. tubing. The resonator was able to impart resonant energy to the tubing despite the bowing. Applying vibration services at the surface using a Resonator imparting impacts at 17 Hz (17 times per second) freed the stuck element inside of the wellhead spool in just under 10 seconds.